

Developing NaturaCos Game

by

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Dissertation submitted in partial fulfilment of
the requirements for the
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(Business Information System)

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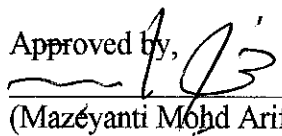
CERTIFICATION OF APPROVAL

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A project dissertation submitted to the
Business Information System Programme
Universiti Teknologi PETRONAS
in partial fulfilment of the requirement for the
Bachelor of Business Information System (Hons)
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Approved by, 

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CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

A handwritten signature in black ink, appearing to read 'Fatin Nazurah', is written over a horizontal line.

FATIN NAZURAH BINTI MARAM

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ABSTRACT

There are a wide range of cosmetics nowadays - and the number of cosmetic brands is growing larger day by day and can be considered as a fast expanding industry. It is not surprising to learn that children from age 8 to 12 have started wearing mascara and eyeliner. Reports show that the market size has increased over the years, with market size worth of RM 3692 million in 2008. However, cosmetics nowadays can cost a lot, and because they are used frequently, a person can spend a lot on cosmetics alone. Statistics have shown that Malaysians spend RM 148 million on cosmetics annually. Moreover, many people do not realize the dangers that these cosmetics and skin products can cause harm to their health and the environment. On the other hand, the word 'game' is often seen something that would bring harm rather than benefit. Most people cannot accept or agree that games can be educational and beneficial towards the game players. The objective of this project is to highlight the problems of today's cosmetics and to promote the making of cosmetics using natural ingredients, at the comfort of one's own home. This project was made with using game-based learning approach method of transferring knowledge. The study focused on teenagers and young adults.

CHAPTER 1

INTRODUCTION

1.1 Project Background

“New knowledge always begins with the individual” (Nonaka, 1991). A person’s own personal knowledge can be valuable knowledge to a community or organization. Sharing and transferring knowledge is not an easy task, and can be a challenge in organizations. Finding a suitable method to transfer knowledge effectively can also be a problem, especially when no proper research is done to know the most effective way to transfer the knowledge.

It is now not unusual or bizarre to say that a person can learn and gain a lot of knowledge when playing games. Knowledge can be transferred, shared and managed well with the help of games. The days where all games are designed and made purely for entertainment are gone.

For a while now, it has been agreed that educational computer and simulations games are effective and beneficial in the educational areas of management, medicine, science (Peng, 2004), mathematics (Randel 1992; Allen et. al, 1978), health education (Dorman, 1997) and so on. Peng (2004) also discovered that SimCity, which is a popular entertainment computer game, was praised and was deemed beneficial in terms of strategic thinking development.

Playing games can have a number of positive effects, among them include:

Table 1: Games and its benefits

Scholar	Benefits
Allen et. al (1978)	Improve mathematics achievement scores
Naveteur & Ray (1990)	Can ease feelings of anxiety
Randel et al. (1992)	Help in term of memory retention
Vorderer and Bryant (2006)	Improve spatial skills

Out of 14 studies, Randel (1992) found that 12 shows positive effects which shows that computer games and simulations have better retention over time, compared to conventional classroom atmosphere.

One of Vorderer and Bryant’s (2006) research was on spatial skills. Spatial skill is the ability to visualize and locate objects in a three-dimensional space. Positive effects were found in both the development of 3-dimentional and 2-dimentional mental rotation in middle and high school students in the United States (Vorderer and Bryant, 2006).

These researches and findings from the scholars show that computer games can also have positive effects, and not just negative effects on the players. A number of researches were dedicated to prove that playing video games have a relationship with violence in teenagers; however, this has never been proved. This is why this project will go into the direction of knowledge sharing using game as its tool, instead of the usual and traditional way of learning by lecture or in the classroom.

Puentedura (n.d.) have concluded that the most effective games in education is in language arts and Mathematics, in which 12 out of 14 studies showed positive

results. Social sciences is said to be the next most effective, with 13 out of 46 showed encouraging results.

On the other hand, health issues nowadays are mainly focused on food – what people eat and how they cook their daily meal. This project, however, will focus on making natural cosmetics that is not harmful for the skin. The motivation of choosing natural cosmetics is due to two reasons: to teach on how to produce natural cosmetics - many women are unaware about the many harmful ingredients contained in the cosmetics range, from facial care, hair care and body care; and also to create awareness of the existence of natural cosmetics.

1.2 Problem Statement

In the United Kingdom, the Daily Mail reported that the average women spend about £ 130 a year on cosmetics alone. Meanwhile, a report by YWCA states that a total of \$7 billion dollars are spent on cosmetics by women in the United States. The total would equal to \$100 a month for each women. This number shows that the price of cosmetics nowadays is very much expensive.

Moreover, most of the people are more worried about the appearance and exterior look of the skin and not the effects that the cosmetics and skin products can cause to the skin (Norudin et al., 2010). Many of these women do not realize that a majority of cosmetics nowadays are full with carcinogens and chemicals which can harm a person's health.

The awareness of young women toward the harmful effects that cosmetics can have is somewhat nonexistent, as they rarely read the ingredients labels of the cosmetics that they buy and use. They are more worried about their current self and chose not to think about what might happen overtime when they use these harmful cosmetics.

Other than that, the chemicals contained in cosmetics can create allergies to a person's body. Cosmetic makers often do not disclose the full ingredients on their product labels. Canada had established the law in which all cosmetic makers must disclose their full ingredients list in the product labels in 2006 (Kage, 2006). Many countries, including United States, are still behind and do not make it a law for cosmetic makers to list the full ingredients on their products. United States, under the Safe Cosmetics Act, has just recently introduced a bill that, if passed, will make it compulsory for cosmetic industry to give the full product ingredients on all of the product labels.

Moreover, many are also unaware about the existence of natural cosmetics, and that natural cosmetics can serve as a substitute to the harmful cosmetics.

Thus, this project will be using game as a method of transferring knowledge of making natural cosmetics, and also informative facts about some of the harmful ingredients found in everyday cosmetics.

1.3 Objectives

The objectives of this project will be:

- To propose a game-based application in natural cosmetics making.
- To develop a game that can be used as an alternative tool to transfer knowledge in making natural cosmetics.

1.4 Scope of the Project and Relevancy of Project

In these days of modernization, the number of women and youths wearing makeup and cosmetics increases over time, but many are truly unaware about the dangers it can bring to the body. This project will create awareness to the women of the

society, especially young adults by educating them about how to make cosmetics that are harmless to their health.

This project will be targeted to female high school and also university students. Although in United States it was reported that it is the tweens' (females aged 8 to 12 years old) cosmetic usage that are on the rise (the NPD Group, n.d.), however, this project is targeted to high school and university students as most of them fend for themselves. On top of that, it has been reported by the Entertainment Software Association (ESA, 2010) that 40 percent of game players in the United States are female. In fact, women age 18 or older have a higher percentage of game playing (33 percent) compared to boys age 17 or younger, which is at 20 percent of the population. This proves that females, too, are interested in playing games.

This project is relevant as most of cosmetics nowadays are too expensive. Moreover, many people are unaware of what they are really putting onto their skin on a daily basis. Thus, this project can help in decreasing the amount spent in buying cosmetics and also decrease the exposure to many kinds of toxins present in everyday cosmetics.

CHAPTER 2

LITERATURE REVIEW

2.1 Cosmetic Usage

A consumer research company in the United States, the NPD Group reports that within the year 2007 to 2009, the percentage of girls from age 8 to 12 who use mascara rose from 10 percent to 18 percent, and 9 percent to 15 percent for eyeliner (the NPD Group, n.d.). Both percentages show an increase of nearly double amount. This group of youth, also called 'tweens', are growing more and more conscious on these certain kind of cosmetics – the mascara, eyeliner and also lipstick (Quenqua, 2010).

In 2003, even during the time of uncertainty of rising petrol prices and war worries, consumers in the United States are apparently not willing to give up or rein their spending on cosmetics products (the NPD Group, 2003). Timra Carlson, the president of NPD Beauty division of The NPD Group states that “Now more than ever, men and women of all ages want to look and feel good”.

In a survey of the categories of products that consumers are not willing to reduce their spending on, the NPD reports that skincare and cosmetics category came up on top of the list with 55 percent. Trailing 5 percent behind is eating out/carry-out fast food, and also eating out at full service restaurants with 47 percent.

In mid 2009, the sales of cosmetics are better than the first half of the year, after it was being reported that consumers are holding back their spending on cosmetics (the NPD, 2009).

In the United Kingdom, a research by the Daily Mail in 2010 saw that an average woman spends roughly £130 worth of cosmetics per year – which translates to £9,000 in 65 years of her lifetime.

Meanwhile, a poll conducted to 3,000 women by Superdrug, Britain's second largest beauty and health retailer, reveals these numbers:

- 68 percent say that they would not let people see their faces without makeup, and that without full makeup, they feel less confident.
- Half of them say they wear makeup “all the time”.
- 16 percent would not show their bare face to their parents.
- 70 percent will not leave their home without some makeup.
- 71 percent admits that they think they are much prettier with makeup on.

These numbers and percentages clearly show that women consider makeup as something very important and are a part of their lives – they are not willing to give up their spending on cosmetics and spent quite a large sum of their money to buying cosmetics. Some of them cannot live without cosmetics and even feel vulnerable without makeup.

Meanwhile, in Malaysia, it was reported that Malaysians spend an estimated US\$500 million on cosmetics, annually (Lim, n.d.). Lim also note that the market size of the cosmetics and toiletries industry is on the rise for the last 5 years, between 2004 and 2008, and says that the industry “is a money earner and has plenty to offer”, based on the ratio of the market shares.

	2004	2005	2006	2007	2008
Soft drinks (million litres)	937	970	1,012	1,053	1,096
Soft drinks (RM million)	2,192	2,251	2,339	2,410	2,490
Tobacco (RM million)	5,180	5,594	6,010	6,426	6,839
Cosmetics and toiletries (RM million)	3,084	3,216	3,361	3,520	3,692
Tourism receipts (US\$ million)	8,198	8,846	8,974	9,066	

Figure 1: The Market Size of the Cosmetics and Toiletries Industry

These reports and numbers show how much cosmetics plays an important part of women's life. However, are all women aware of what they are putting onto their skin on a daily basis, and the harm they are facing?

In order to look more fashionable and beautiful, many agree that cosmetics must play a part. It was also said that cosmetics are important in the creation of an image of a person or being presentable in the presence of others (DeLong and Bye, 1990). More and more females are using make-up on a daily basis, and the numbers are very likely to grow in the next few years. However, the usage of most cosmetics can be harmful to ones' health, as the cosmetics are made with ingredients that can cause many health risks to the users.

Apart from the apparent function of protecting the muscle, bones and internal organs of humans, the human skin are also able to either partially or completely absorb products that are applied onto the skin into the bloodstream. Fairley (2001) has stated that for products that we use on our skin, about 60% of it will most likely be absorbed and deposited into the circulatory system. It is therefore important that the cosmetics and beauty products that people use daily contains no dangerous ingredients as this will indirectly harm the well-being of their body.

Some of the harmful ingredients that can be found in makeup, shampoos, and body lotions are of course, the cancer-causing carcinogens. These include chemicals that

scientists called the “environmental estrogens” such as placental extracts and benzophenones. According to a research by Cornell's Program on Breast Cancer and Environmental Risk Factors (BCERF), these chemicals can mimic a woman's own natural estrogens, and furthermore add up to the normal estrogens hormone, thus increasing a woman's risk of developing breast cancer. This can happen as the environmental estrogens can cause mutations to the DNA by dividing the breast cells – a process that causes the breast cells to lose control. This process will slowly change the normal breast cells to tumour cells.

One of the most prominent and harmful environmental estrogens is the infamous paraben – which acts as a preservative and are widely used in the cosmetics and pharmaceutical industries. The most common parabens used in cosmetics are methylparaben, ethylparaben, propylparaben, and butylparaben. A study reveals that in a sample of 20 breast tumours, average levels of 20 nanograms/grams of parabens are detected (Darbre et al, 2004). In United States, breast cancer reportedly affects one in eight women during their lives, and also is the main cause of death of any cancer after lung cancer.

Other than parabens, there are also a lot of other ingredients that are harmful to one's health, among them is a commonly used hydroquinone. Used in most of skin-lightening products, hydroquinone is described by Cantoria & Malburg, (2010) as “the worst substance being used in personal care products”. This is because hydroquinone has the potential to increase the chance of the skin to be exposed to the UV and UVB rays of the sun, which is known to be harmful (Cantoria & Malburg, 2010).

These carcinogens and other dangerous ingredients in cosmetics are something that must be avoided, as it can seriously damage our health. The use of natural cosmetics is one of the steps in minimizing the risk of being diagnosed with cancer or other diseases and health problems.

2.2 Cancerous Issue

In Malaysia, breast cancer is said to be the most common cancer in women, besides being the number leading cause of cancer deaths (Pantai Cancer Support, n.d.). The Malaysian National Cancer Registry reported that in 2003, a total number of 3738 female breast cancer cases were reported, which accounted for 31 percent of all female cancers (Lim & Halimah, 2003).

Other than that, the report also shows that breast cancer is the most frequent cancer in three age groups: 15-49 years old, 50-69 years old and over 70 years old. For female aged 0 to 14 years old, the most frequent cancer is leukaemia.

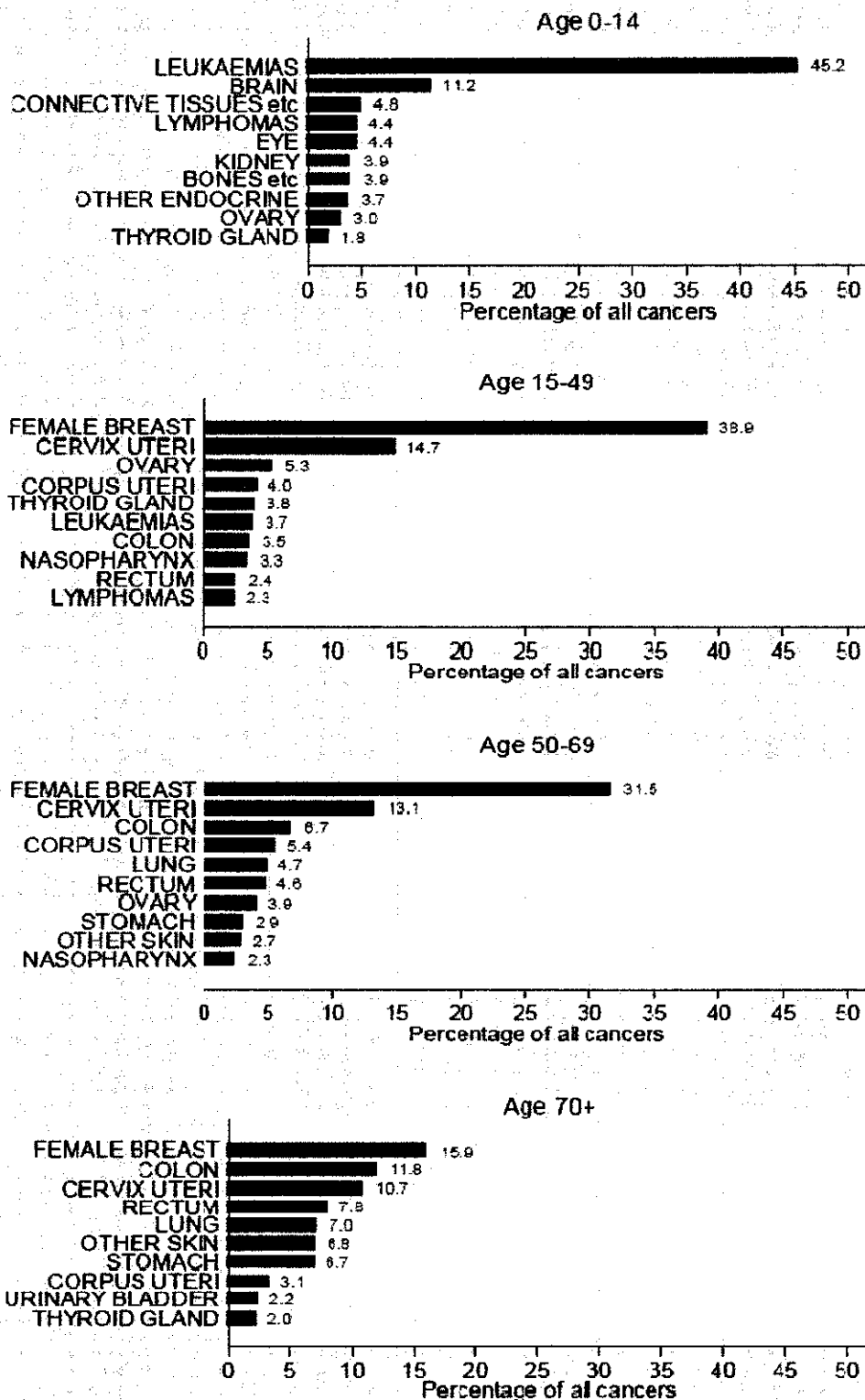


Figure 2: Types of Cancer in Females

These numbers are astounding figures, and urges women to take as much precautions as they can. Breast cancer can affect both men and women even though they have no

family history of breast cancer. There are many reasons that can lead to breast cancer, among them being age, alcohol, cigarettes, lifestyle and also dietary fat. Other than that, it is also possible for someone to have with breast cancer because of cosmetics that they use in their daily lives, as a research by Darbre et. Al (2004) has found some ingredients used in cosmetics in some of the samples of breast tumours.

2.3 Natural Cosmetics

Natural cosmetics are any products that are free from any of potential health risks, such as parabens, preservatives, animal products and so on.

Nowadays many of the leading cosmetics brands are turning into natural and/or organic cosmetics. Recently, Estee Lauder secured a deal with natural ingredients supplier (McDougall, 2011). Many of cosmetics brands are also following the footsteps of making natural cosmetics from natural ingredients, such as Burt's Bees, LUSH Cosmetics, L'Occitane and so on.

There are many benefits of using natural cosmetics. Of course, for one, the will be no or few exposure to carcinogens, compared to the non-natural cosmetics range. As the natural ingredients in natural products are not dangerous, people can worry less about what they are putting on their skin, even if they are absorbed in the bloodstream and circulatory system.

Other than that, the use of natural knowledge will contribute in making the environment a better place. People are mostly unaware of the large amount of harmful toxins in the environment. Products like plastic baby bottles, frozen food packages can expose us to minute levels of toxins (Oz, 2008). Oz also mentioned that microwaving plastics can also cause toxins from the plastic to be absorbed by the food. Natural products are biodegradable and contain no toxins that will harm the

environment as it washes down the drain, and there will be no or less chemicals and toxins releases into the environment. People are exposed to many toxins in the environment even without the help of cosmetics, and therefore we have to try and reduce the amount of toxins and chemicals released to the environment.

2.4 Knowledge

The definition of knowledge is not easy to define, and can differ from person to person. It is understood, however, that data and information plays an integral part with knowledge. Debowski (2006) interprets knowledge as “the process of translating information and past experience into a meaningful set of relationships which are understood and applied by an individual”.

Information, data and knowledge differs in meaning, although they are interconnected to each other, based on the definitions of these researchers:

Table 1: Definitions of Knowledge

Source	Definition of Knowlege
Applehans et al (1999)	The ability to turn information and data into effective action.
Debowski (2006)	The process of translating information (such as data) and past experience into a meaningful set of relationships which are understood and applied by an individual.
Arrow (1984)	A set of expectations held by agents and modified by the arrival of information

Based on Applehans (1999), data is something that can be measured, or comes in the form of measurements – pounds per square inch (psi), gigabytes (GB), meters (m),

etc. Information, on the other hand, is “a statement of fact about these measurements”.

Data, information and knowledge are interrelated and are a part of sequential order, as many scholars suggested (Zins, 2007). Zins (2007) claim that “data are the raw material for information, and information is the raw material for knowledge”.

One of the most popular knowledge creation processes is the Socialization, Externalization, Combination and Internalization (SECI) model, developed by Nonaka & Takeuchi (1995).

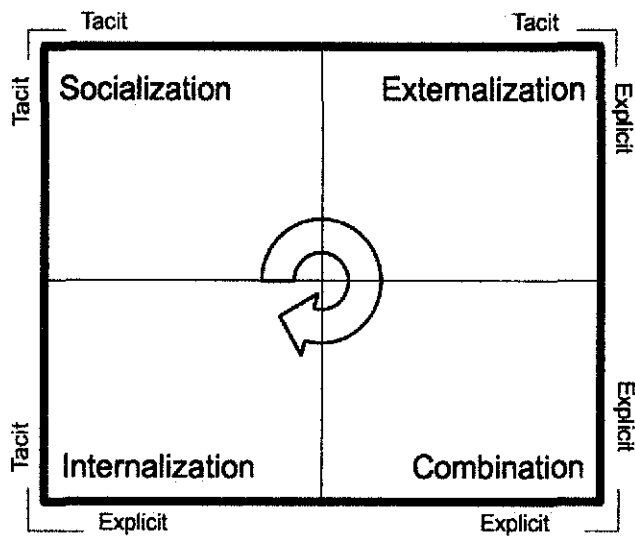


Figure 3: Knowledge Creation by Nonaka & Takeuchi (1995).

Nonaka (1991) describes explicit knowledge (know-that) as “formal and systematic”. In other words, it is a knowledge that can be easily shared with others – which is knowledge that can be transmitted and shared through many forms of sharing (Debowski, 2006).

Tacit knowledge (know-how), on the other hand, is highly personal (Nonaka, 1991) and is the opposite of explicit knowledge. Nonaka describes it something that is not easy to formalize, thus making it difficult to be presented or shared with others.

Based on the SECI Model by Nonaka and Takeuchi, there are four basic patterns for creating knowledge which are:

1. Socialization

Tacit knowledge is converted into tacit knowledge.

2. Externalization

Tacit knowledge is converted to explicit knowledge.

3. Combination

Explicit knowledge converted to another form of explicit knowledge

4. Internalization

Explicit knowledge converted to tacit knowledge.

This project will develop a game that will use internalization conversion, in which explicit knowledge will be converted into tacit knowledge.

2.5 Knowledge Transfer (KT)

It is not surprising to discover that people are having a hard time with knowledge management and transferring knowledge, be it with another individual, with the community, in an organization, or within industries. Unsurprisingly, knowledge transfer is most difficult in organizations (Levine and Gilbert, 1998). Knowledge transfer can be said to be similar as knowledge management, in terms they both are about organizing, creating, capturing or distributing knowledge, only that knowledge transfer is more complex (Argote & Ingram, 2000).

Argote & Ingram (2000) describes knowledge transfer as “the process through which one unit (e.g., group, department, or division) is affected by the experience of another”. Meanwhile, Szulanski (1996) define it as “dyadic exchange of

organizational knowledge between a source and a recipient unit in which the identity of the recipient matters”. KT is described by Szulanski as a process rather than just a one-time practice.

Transferring knowledge can be done in a lot of ways. From formal methods such as conferences, lectures, interviews to informal methods such as observations, informal talks, game, text messaging and so on.

Different people react differently with each method. Age also plays a part in transferring knowledge (The Conference Board, 2008). It can make a difference if we know about the generational preferred method of learning.

The learning styles of people nowadays can be divided by the generations of people. There are four generations of people that have been officially identified, which are:

- Traditionalists
- Baby boomers
- Generation X
- Generation Y

Baby Boomers, those born between the year 1947 and 1965, make up the largest percentage of the world’s population today. Generation X and Y can be considered as the younger generations. People who are born between 1966 and 1977 are of Generation X and Generation Y is born between 1978 and 1995.

Most of Generation X and Y are still studying, either in colleges or schools. In Generation Y, there is said to be a group called the "Millennial Generation", which are those born after the year 1982. The Millennials have the characteristic that are fascinated by new technologies. Oblinger (2003) stated that the percentage of

Internet usage is high for the younger aged people. They normally use Internet for school, work, and leisure. Technology is seen as a natural part of the environment.

Teenagers nowadays communicate through e-mail and instant messaging. They prefer to keep in touch through the Internet compared to the telephone (Oblinger, 2003). It can be said that the younger generations are learning and using technology as a way of learning, and not the traditional way of learning. McCrindle (2003) researched and found that one of Generation X and Y's learning styles is kinesthetic. This means that the generations "learn best through doing, experiencing, or being involved". Thus, the development of the game is using knowledge transfer as the game will transfer knowledge of cosmetics making as well as information on harmful ingredients found in everyday cosmetics.

2.6 Game

Salen and Zimmerman (2003) define game as “a system in which players engage in an artificial conflict, defined by rules that result in a quantifiable outcome.”

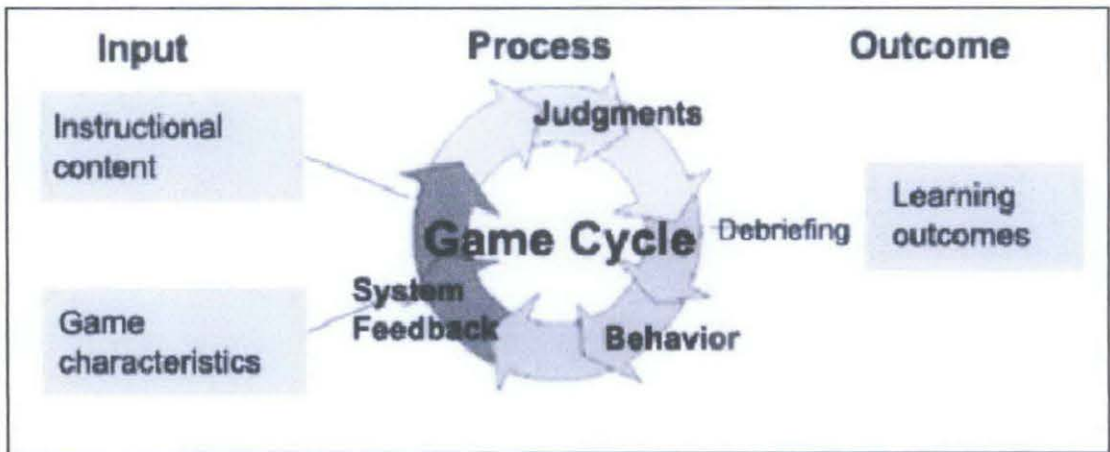


Figure 4: Game Model (Garris et al., 2003)

The Game Model focuses on Input, Process and Outcome. In input model, it emphasizes on instructional content and game characteristics. Game characteristics is one of the most important features and researchers always debate on what are the

most essential part of a game. Some of the essential components from the researchers' point of view are interactivity, interactions, dynamic visuals, rules, control and etc (Garris et al. 2002).

Some of the advantages of the model, as highlighted by Garris et al. (2002) are that it “provides a structure to organize and integrate the literature on instructional games”. Garris et al. (2002) also emphasized on the game cycle process, which is triggered by the game features, and added that they see the game cycle as “iterative”, meaning that the game cycle is repeated until the desired outcome is reached. In this sense, it involves a loop at judgement-behaviour-feedback.

It would not be an exaggeration to say that most children and teenagers nowadays have been exposed to computer games. People of all ages from around the world apparently have been playing computer games approximately 800 million hours per month. In 2010, it was reported by Entertainment Software Association (ESA) in United States that only 33 percent of American households do not play computer or video games. With regard to online games, the difference between male and female players is only 16 percent, in which 58 percent of online game players are male.

In a life of a student, 10,000 of their hours are estimated to have spent playing videogames (Prensky, 2004). Prensky also noted that the hours spent are the same for playing (regular) games, talking and using data on their mobile phones, while the hours spent for book reading are said to be only 5,000 hours at most. The numbers clearly indicate how much students are playing games. Moreover, Prensky pointed out that generation of students now is “a generation that thinks graphically rather than textually” and “is accustomed to seeing the world through a lens of games and play”.

2.6.1 Game Statistics: Sales, Demographic and Usage

The number of games purchased and played has no doubt increased over the years. Between 2008 and 2009, the ESA collected information on the sales of computer and video games, in which there is a significant rise on the number of units sold and also sales in dollars. In 2008, 11.7 billion worth of computer and video games are sold, while in 2009, there is a slight decrease with 10.5 billion dollars worth of games sold. Number of units of games sold also decrease within the two years, with 298.3 million units sold in 2008 and 273.5 units sold in 2009. Although the numbers decrease within these two years, the number of sales has always been increasing from 1996 to 2008.

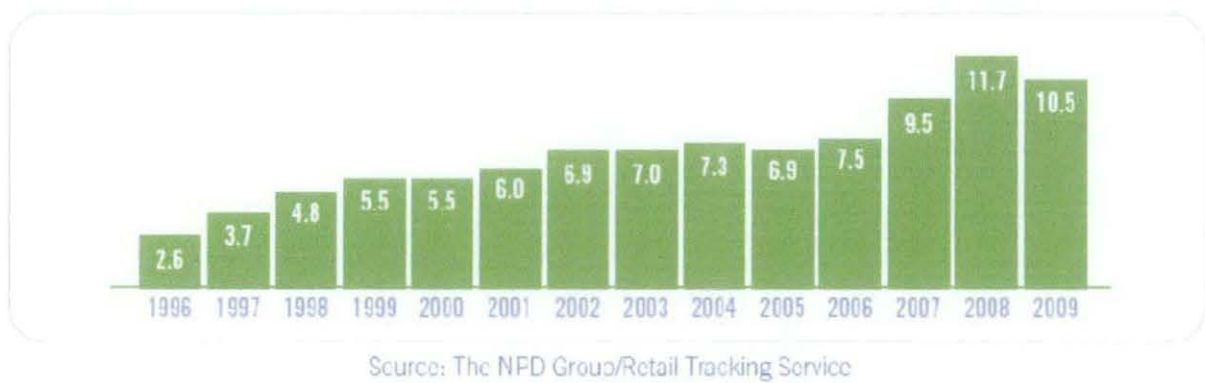


Figure 5:U.S. Computer and Video Game DOLLAR Sales Growth (Dollars in Billions)

Other than that, the ESA (2010) also reported that there are about 40 percent of female gamers in 2009. Women of age 18 and older also apparently have a higher portion of the game-playing population than boys aged 17 or younger. The number rose 6 percent when it comes to game buyers, in which female buyers make up for 46 percent of the total numbers. The number is about the same for online gamers, where 42 percent of online gamers are female.

Furthermore, ESA stated that the average game player age is at 34. A large number of the game players are people aged from 18 to 49 years old.

For these reasons, this project will go into the direction of developing a game in order to create awareness about the dangers of cosmetics and also the methods of making natural cosmetics.

CHAPTER 3

METHODOLOGY

3.1 Research Methodology

This project requires intensive research and information searching on these following topics:

- a. Knowledge and knowledge transfer
- b. Cosmetics, its usage, the harmful ingredients and the effects that they can have to a person's health
- c. Natural cosmetics and its benefits
- d. Game and the characteristics of games that can attract the attention and interest of people.

3.1.1 Online Database

The Internet will help the author in terms of searching for journals, news, researches, and related work that have a connection with this project. Some of the online resources used for this project are Google Scholars, Science Direct, IEEE, ACM and etc.

Other than that, the author also uses YouTube to search for recipes as well as the directions on how to make the natural cosmetics.

3.2 Questionnaires and Surveys

The author used surveys in this project targeted to female university students. The survey was done online as well as direct with the users.

3.2.1 Survey Questions

A user acceptance testing survey has been done with seven questions asked. A total of 10 respondents responded to the survey.

The questions asked were as follows:

- The overall look for NaturaCos Game is...
- Playing NaturaCos Game is...
- The instructions of how to play the game is...
- The tutorial given is...
- NaturaCos Game helps in teaching me how to make natural cosmetics.
- The recipes provided are helpful in helping me making the natural cosmetics myself.
- The instructions given are helpful in helping me making the natural cosmetics myself.

3.3 Game Methodology

The flowchart below by Vroman (2009) was used to help develop the game.

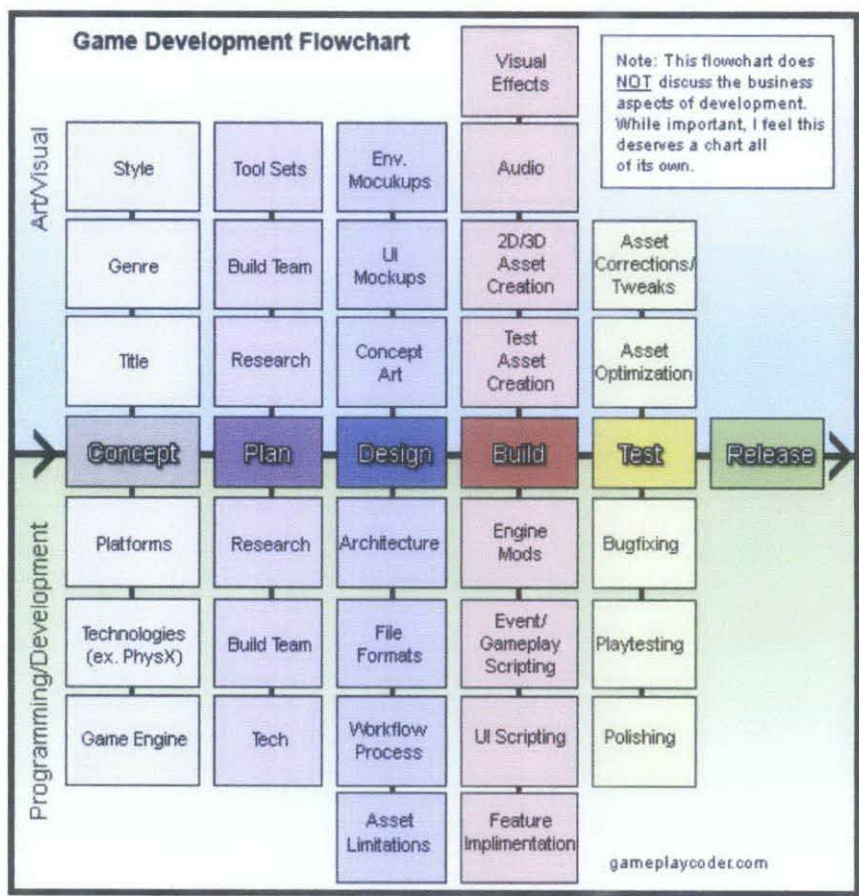


Figure 6: Game Development Flowchart (Vroman, 2009)

Concept

The first step in the Game Development Flowchart is Concept in which the style, genre, title, platforms, game engines and technologies are selected. For this project, this will be the initial concept of the game:

Title: NaturaCosGame!

Genre: Game for female adults; Fun-learning

Style: Casual, not too colourful

Plan

Researches on what type of games are popular among female adults, and research on how the characteristics of the game should be. This includes whether music should be played or not, how the interface would look like, and also what colours should be used in the game.

As discussed by Marc Prensky (2004), he stated that the generation of students now is “a generation that thinks graphically rather than textually”. Based on this statement, it is evident that students do not like to view or read something that is too full with words.

The game, therefore, is done with fewer words to encourage the player participation. Instead of words, the game consists of buttons and icons. For example, the author will use a button in the shape of a house instead of using the word “Home” to navigate the game.

Other than that, the author also did research on fonts, images and icons to be added to the game. It is vital for the icons to be professional-looking as the game will be played by female young adults and also adults. The fonts used play a part as game players also like to see a creative game in terms of appearance. Therefore, the author will keep in mind the fonts used for the game.

Design

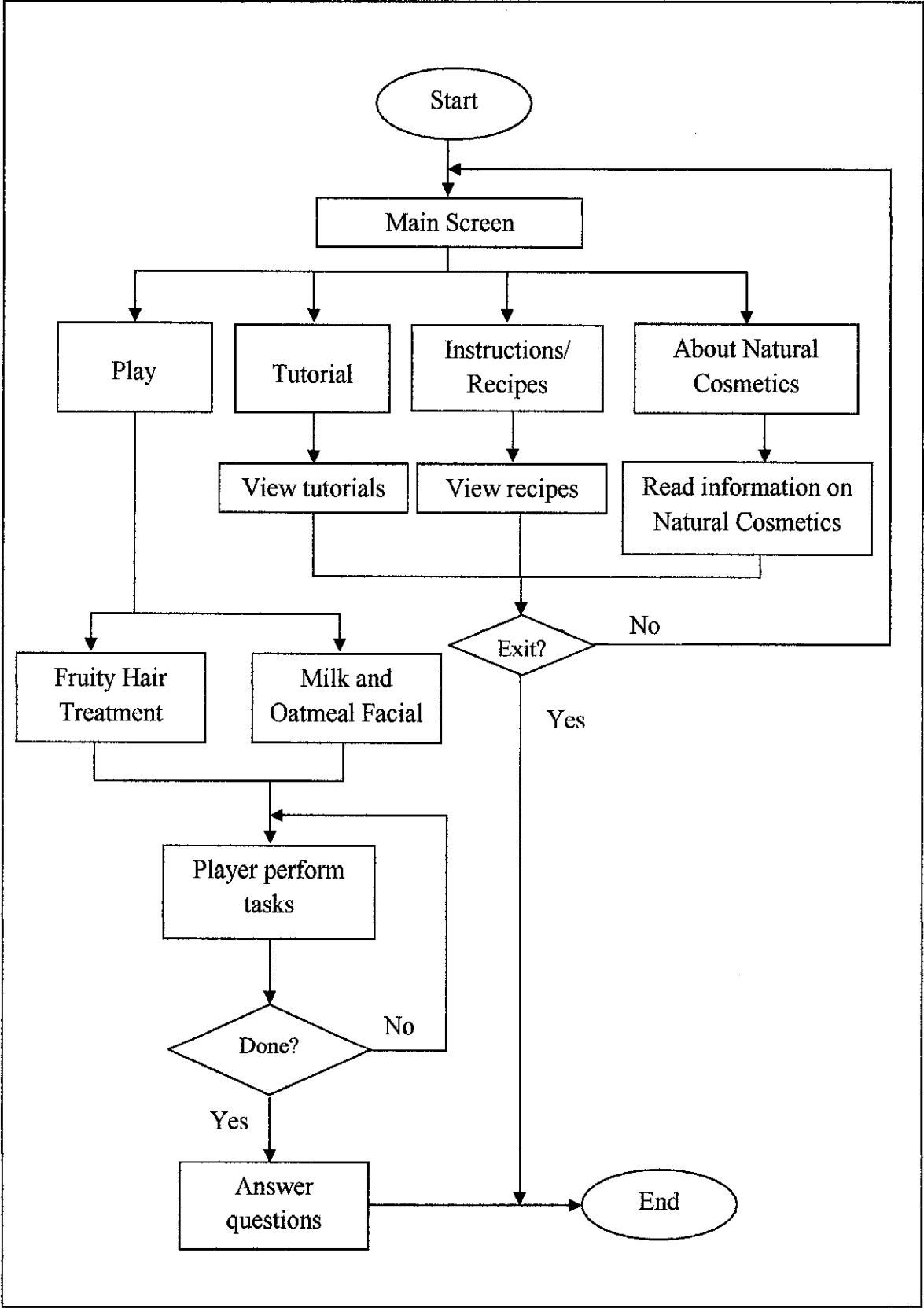


Figure 7: Game Flowchart

Build

This game is going to be in 2D view, in which player will have to perform actions by using the mouse. There will be sounds in the game, for example when the player presses a button in the game.

Testing

Testing of the game will be done in Universiti Teknologi PETRONAS, where the author will target female students. Testing phase will most likely be done a number of times, as changes would need to be done according to the feedbacks given by the game players.

3.4 Game Tool

This project was developed using:

- Adobe Flash Professional CS5
- Adobe Photoshop CS5

The game is prepared using ActionScript 3.0 language. In Flash, the graphics are drawn in frames and the Action Script is written either on the frames or on the object in the respective frames. The Action Script gives actions or movements to the graphics and objects in Flash.

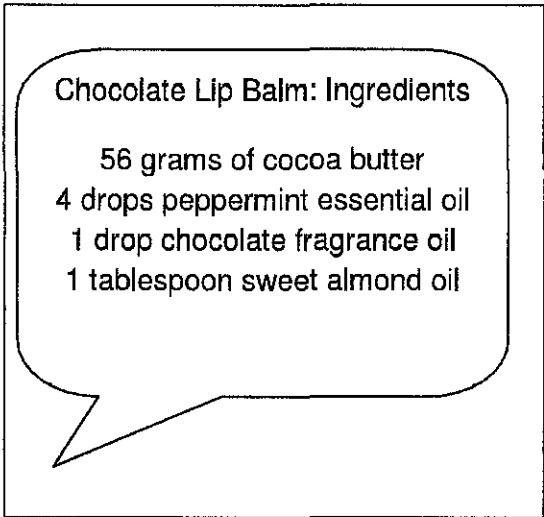
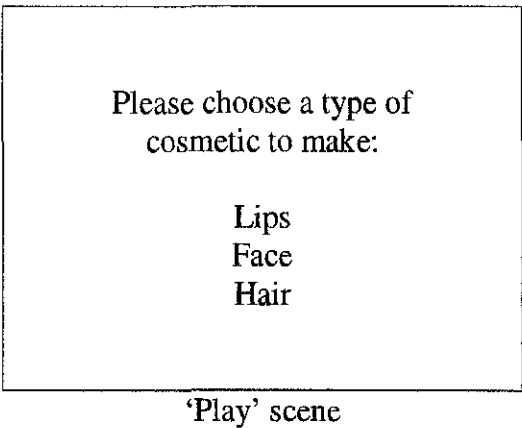
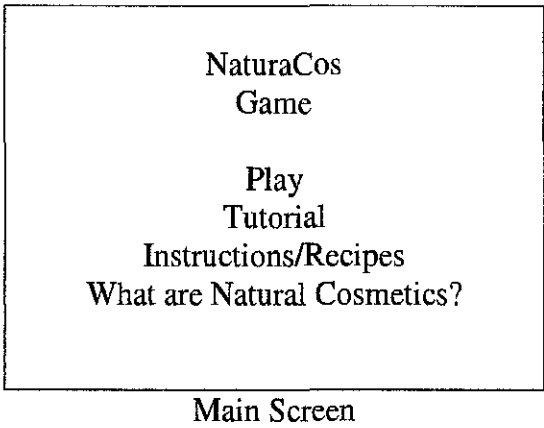
3.5 Game characteristics

Some of the game characteristics include:

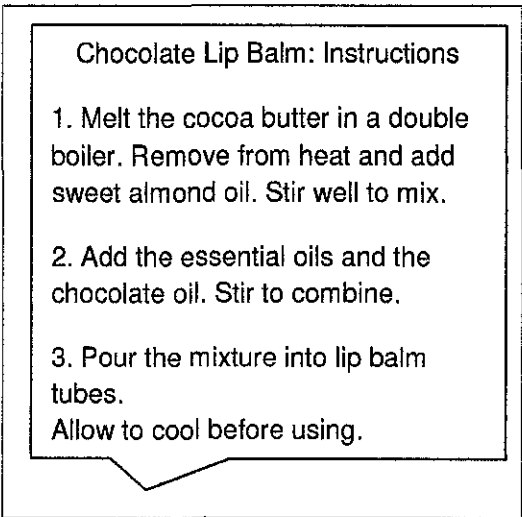
- The game will be one player only
- Player of the game will use the mouse to play the game
- The colours used for the game will be catered to attract the interest of female players
- There will be more than one 'menu' on how to make natural cosmetics

3.6 Storyboard

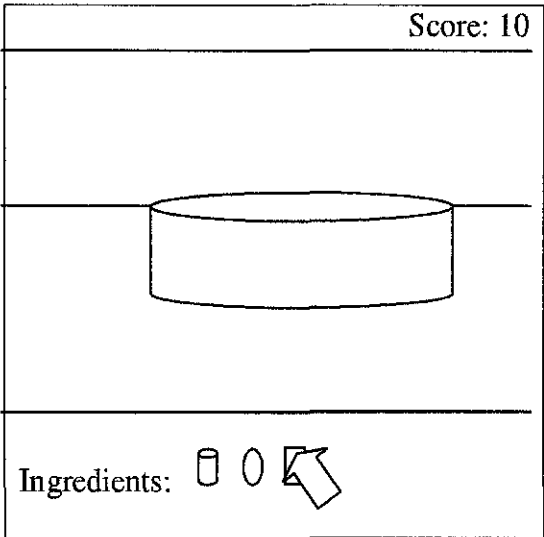
Storyboard: NaturaCos Game



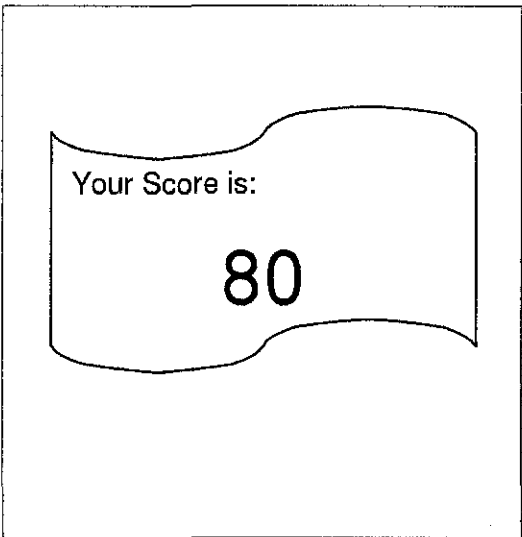
For example: If 'Lips' is selected
Will go straight to the ingredients of
the selected recipe



The instructions will be displayed
after the ingredients



Player will have to complete the recipe
before time ends.



Player score will be revealed when
the game ends.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 NaturaCos Game prototype

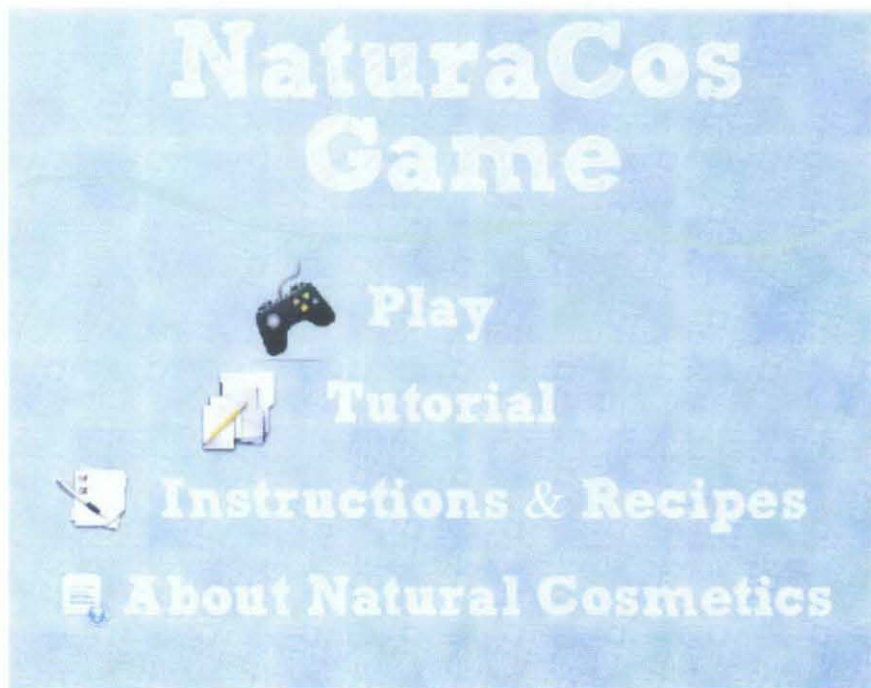


Figure 8: Landing page of Natura Cos

Figure 8 shows the main screen that will be seen at the start of the game. There are four menus to choose from, which are Play, Tutorial, Instructions and Recipes (of the natural cosmetics) and also About Natural Cosmetics.

4.1.1 Play

The figures below show the Play scene. From this scene, the player can choose to play between two recipes: Fruity Hair Treatment (top icon) or Gentle Milk and Oatmeal Facial (bottom icon).



Figure 9: Play Main Scene

The scene in Figure 10 below will appear when the player chooses 'Fruity Hair Treatment'. This recipe requires the player to put all the ingredients into a blender.



Figure 10: Play Scene



Figure 11: Play Scene (after apples are added)

The score will be updated as the player puts in the ingredient(s). For every correct ingredient, 10 marks will be rewarded to the player. The player can also gain clues by viewing the recipe while playing the game, but 5 marks will be deducted for each click on the recipe.

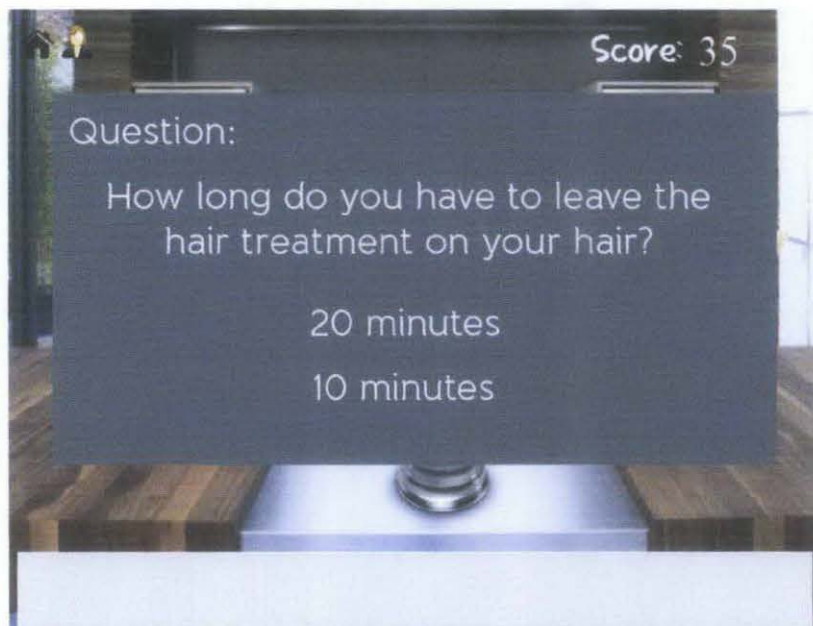


Figure 12: Question regarding the recipe

Figure 12 and Figure 13 is the scene that will appear after the player is done with the steps based on the recipe. The questions asked are based on the current recipe that the current player is currently playing. Every correct answer will earn the player 10 marks, and for every incorrect answer 5 marks will be deducted from the current score.

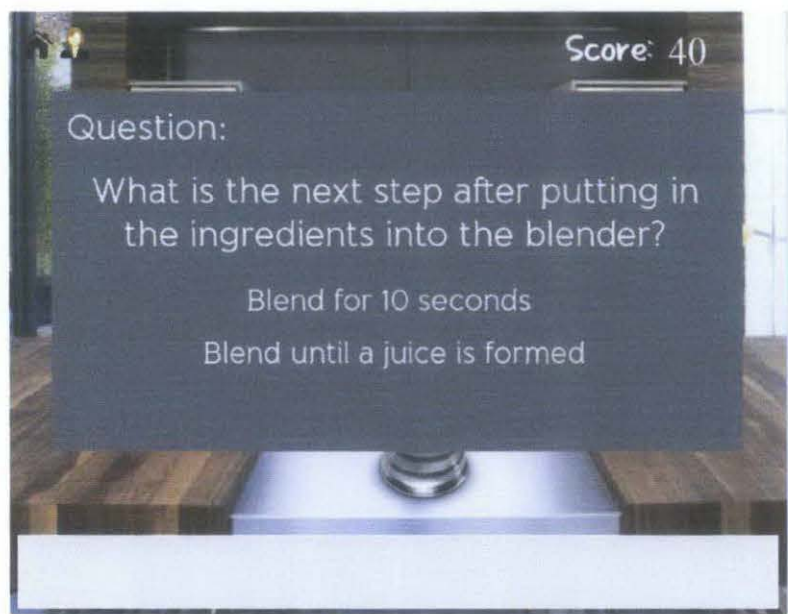


Figure 13: Question regarding the recipe

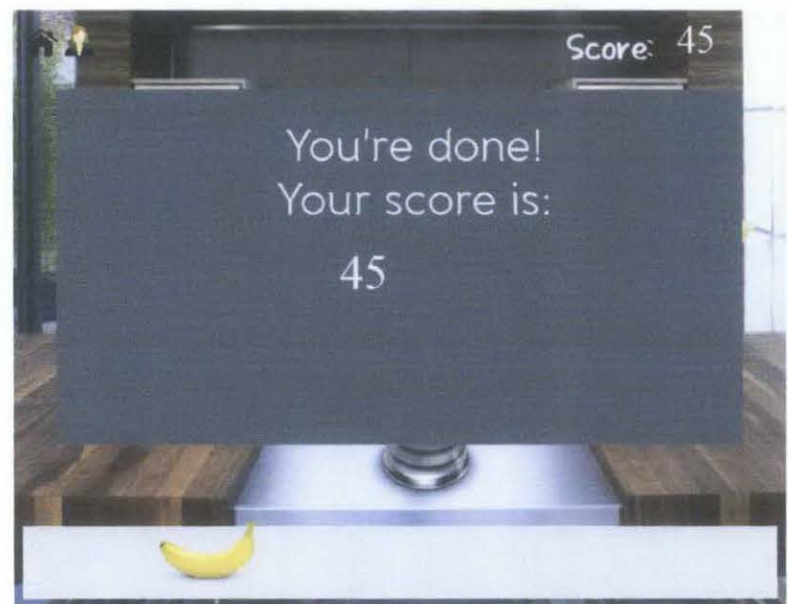


Figure 14: The total score for the game

After the players have answered the questions, the total marks will appear on the next scene (Figure 14).

4.1.2 Tutorial



Figure 15: Tutorial Main Screen

The tutorial scene is where the players can see the tutorial on how to make the cosmetics. When a player clicks on either hair or face, the recipe and instructions will appear on the screen as well as step by step instructions on what to put in the recipe.

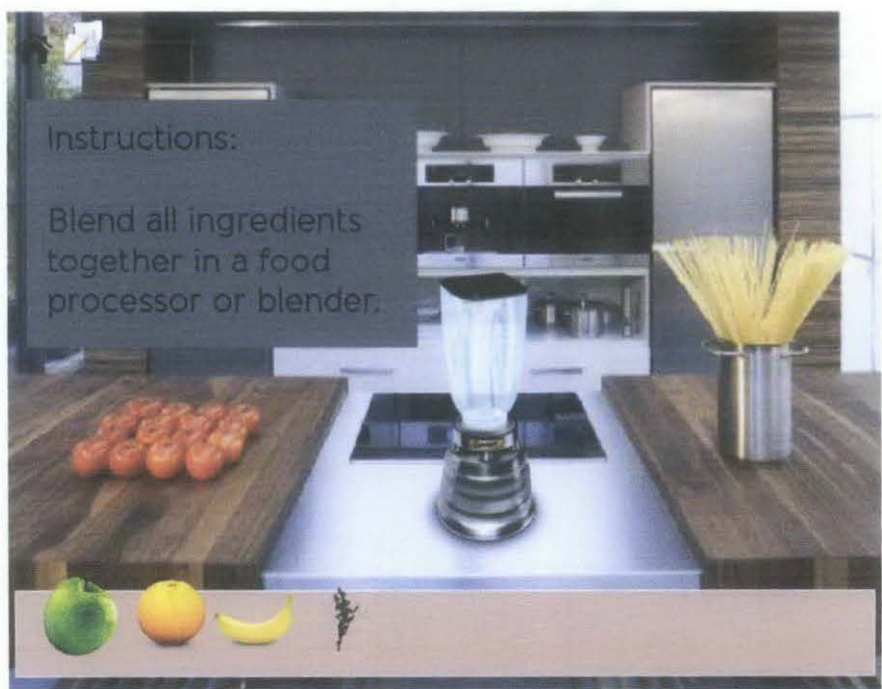


Figure 16: Tutorial for 'Fruity Hair Treatment'.

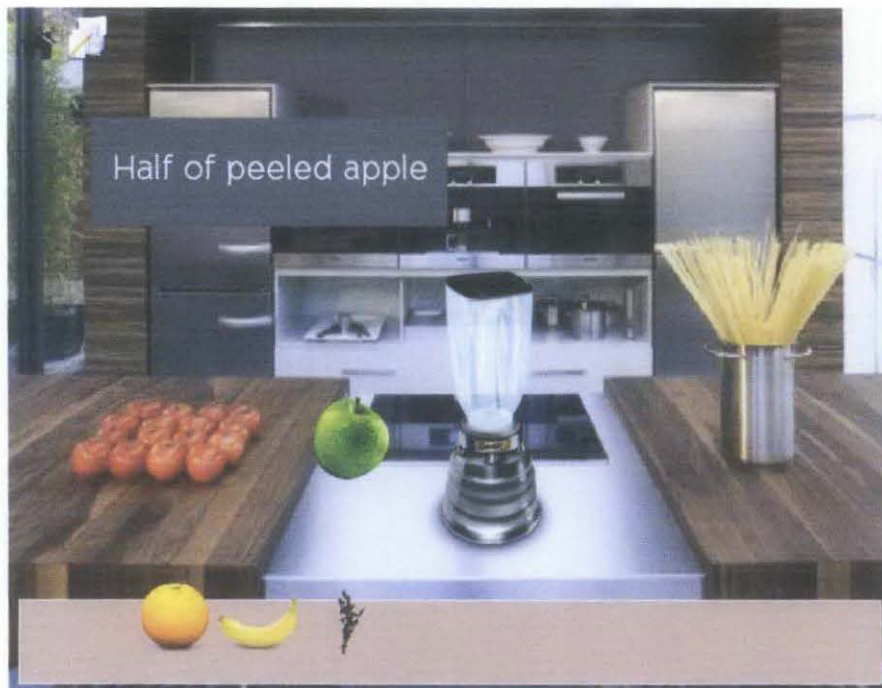


Figure 17: Tutorial for 'Fruity Hair Treatment'- apple is being added into the blender.

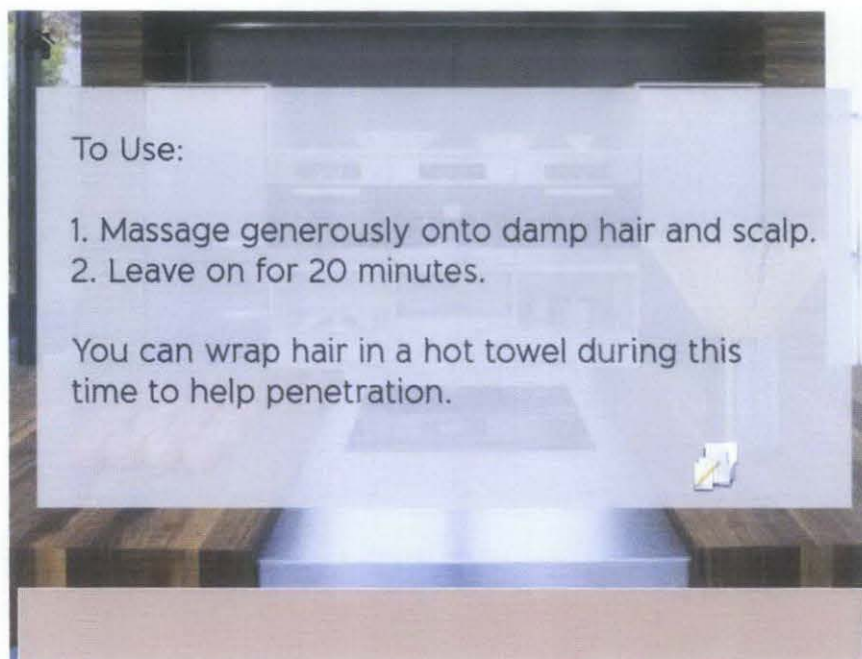


Figure 18: The last scene for the tutorial. The last scene mainly shows how to use the cosmetics made.

4.1.3 Instructions and Recipes

When a player selects the Instructions and Recipes from the menu, the player will be able to choose two recipes to view: Fruity Hair Treatment and also Gentle Milk and Oatmeal Facial.



Figure 19: Main screen for Instructions and Recipes.



Figure 20: The ingredients and instructions for the Fruity Hair Treatment.

When a recipe is selected, the player mainly will see the ingredients needed for the recipe and also the instructions to making the recipe.

4.14 What are Natural Cosmetics?

This scene contain mainly the information on natural cosmetics – what are natural cosmetics and why should a person be using natural cosmetics.

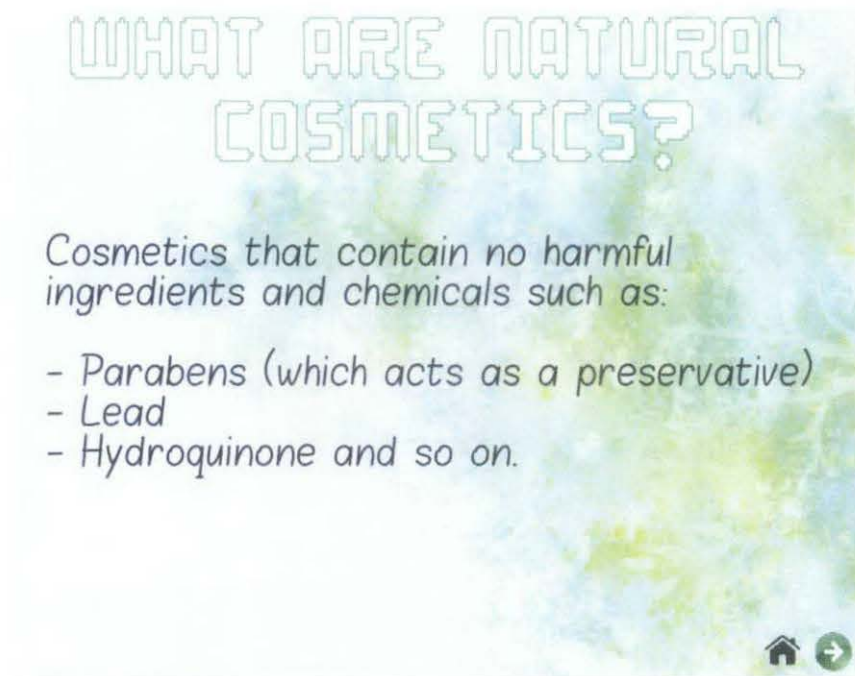


Figure 21: The information on what natural cosmetics are.



Figure 22: The information on why should one choose natural cosmetics.

Project Activities for FYP I

No	Task Name/ Week	Duration (Days)	Status
1	Project proposal	12	Complete
2	Develop work plan	14	Complete
3	Conduct Literature Review	28	Complete
4	Submission of Extended Proposal	1	Complete
5	Proposal Defence (Viva Presentation)	1	Complete
6	Submission of Interim Report	-	-
7	Research on methodology and literature review	14	Complete
8	Submission of Technical Report	1	Complete

Project Milestone for FYP I

No	Details	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Selection of Project													
2	Planning and writing of project proposal													
3	Develop work plan													
4	Conduct literature review and methodology research													
5	Identify project requirements													

Game development flowchart for FYP II

Task	May	June				July				August				September			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
• Overall game flow design																	
• Selection of fonts, pictures and music																	
• Development of main menu																	
• Development of 'Why Natural Cosmetics' scene																	
• Development of 'Recipes and Instructions' scene																	
• Development of 'Tutorial' scenes																	
• Development of 'Play' scene																	
• Pre-EDX																	
• Dissertation																	
• Viva																	
• Final Dissertation																	

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

To conclude, the game that is going to be developed by the author will help players to gain experience and learn how to make their own natural cosmetics. It is important for women to learn this as it can help them from spending too much on cosmetics and at the same time will reduce the risk of getting toxins in their body that can increase the chance of getting diagnosed with cancer. Having to learn how to do it with the help of game can help increase the chance of learning and remembering more as the players will be learn how to make natural cosmetics with the help of pictures and performing the tasks. This is why the author chooses to transfer knowledge with the help of game.

Other than that, NaturaCos Game can help the players gain knowledge on how to make cosmetics in a fun and entertaining manner. This game is an alternative for people to learn instead of the traditional method of reading the recipes and the instructions on how to perform the tasks.

5.2 Recommendations

Through some feedbacks received, there are further improvements and changes that should be made with the game. First, it is recommended for the game to have several stages, instead of just choosing recipes to make. This is in order to incite the feeling of motivation to the player and to avoid making the player feel bored 15 minutes through the game.

Other than that, the scoring system of the game needs to be further improved by categorizing the final score of the player – whether the score they received is good or otherwise.

Moreover, it is also recommended for the recipes to be simpler. The recipes used in the game contain ingredients that are hard to find since it was taken from American websites. Therefore, the players would have a difficult time searching for the ingredients in order to make the cosmetics.

Interaction is vital when it comes to playing games – and this game needs more interaction with the players. As an example, this game can provide a place for the players to give their comments about what they think about the recipe and the finished product of the cosmetic. This will make the players to have more confidence making the cosmetics based on the recipe.

The next recommendation is for the tutorial scene. It is advised for the tutorial to be more clear, detailed and focused when it comes to the ingredients and also the instructions. For example, the game can have an animation showing the actions of cutting a banana to half, according to the recipe.

Last but not least, it is recommended to include the life span of the cosmetics, once it is made. This information can be very useful for the players as they will know for how long they can keep the product.

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